

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented): A light valve comprising:
two cover layers,
at least one of which is transparent,
and an optically active layer between these cover layers,
with the optically active layer including:
a polymer dissolved in a solvent,
with the polymer and the solvent reversibly forming finely divided separate phases upon heating to a specific temperature,
thereby reversibly turning the optically active layer from relatively transparent to relatively opaque,
wherein:
most of said polymer is formed between said cover layers by polymerizing a monomer which is dissolved in said solvent.
2. (Previously Presented): The light valve of Claim 1, wherein:
said monomer is at least 15% soluble in said solvent at a temperature low enough that the heat of polymerization of said monomer does not rise to its phase separation temperature, the solution comprising said solvent, said monomer, and said polymer which is in the process of being formed from said monomer.
3. (Previously Presented): The light valve of Claim 1, wherein:
a crosslinking monomer, with a functionality of two or more, and which copolymerizes with said monomer, and which is soluble in the solution of said solvent plus said monomer, and which is added so that said polymerization forms a crosslinked gel.
4. (Previously Presented): The light valve of Claim 1, wherein:
said solvent is primarily water.
5. (Previously Presented): The light valve of Claim 1, wherein:
said monomer's polymerization is rapid, repeatable, and relatively complete, due to its conjugated unsaturation.
6. (Previously Presented): The light valve of Claim 5, wherein:
said conjugated unsaturation is acrylamide.

7. (Previously Presented): The light valve of Claim 6, wherein:
said acrylamide is N-substituted, and may have a saturated hydrocarbon group substituted onto an unsaturated carbon atom.

8. (Previously Presented): The light valve of Claim 7, wherein:
said N-substituted group or groups are saturated hydrocarbons, and said monomer's total number of carbon atoms is between 5 and 7.

9. (Previously Presented): The light valve of Claim 8, wherein:
more than half of said monomer is N-diethyl acrylamide and/or N-diethyl methacrylamide.

10. (Previously Presented): The light valve of Claim 1, wherein:
said monomer is a mixture of monomers which are selected and proportioned such that the light valve switches at a desired temperature.

11. (Previously Presented): The light valve of Claim 10, wherein:
said mixture of monomers forms a copolymer that is relatively random.

12. (Previously Presented): The light valve of Claim 1, wherein:
said polymer chains do not have many non-chemical interchain bonds which reversibly crosslink the chains.

13. (Previously Presented): The light valve of Claim 1, wherein:
the backbone of said polymer is relatively free from stearic hindrance and is flexible when dissolved in said solvent in order for said polymer's phase separation with said solvent to occur over a narrow temperature band.

14. (Previously Presented): The light valve of Claim 1, wherein:
said polymer formed does not react with said solvent, and/or oxygen, and/or sunlight.

15. (Currently Amended): The light valve of Claims 1 or 3, wherein:
~~the catalyst for said polymerization [[,]] and preferably also for said crosslinking monomer [[,]] is a reducer plus and an oxidizer.~~

16. (Previously Presented): The light valve of Claim 15, wherein:
said catalyst is a persulfate salt plus a metabisulfite salt.

17. (Previously Presented): The light valve of Claim 1, wherein:
the light valve is stabilized against aging by oxygen and/or ultraviolet light by the addition of a hindered amine stabilizer which is soluble in said polymer dissolved in said solvent.

18. (Currently Amended): The light valves valve of Claims any one of Claim 1 through 14 or 16 or 17, wherein:
~~they are it is used to make architectural glazings that control unwanted solar heat and glare.~~

19. (Currently Amended): A sealant made from a saturated hydrocarbon rubber polymer wherein:

the polymer has an average functionality of two or more in order to form crosslinks[[,]]
~~optionally by reacting said polymer functionality with a crosslinker which has a functionality
of two or more, and which is soluble in said polymer.~~

20. (Previously Presented): The sealant of Claim 19, wherein:
said polymer functionality is hydroxy.

21. (Currently Amended): The sealant of Claim 19, wherein:
said crosslinker functionality is ~~isocyanate~~ isocyanate.

22. (Previously Presented): The sealant of Claim 21, wherein:
said isocyanate is trimethyl hexamethylene diisocyanate.

23. (Previously Presented): The sealant of Claim 19, wherein:
a hindered amine stabilizer with functionality that chemically bonds it to said polymer, is
added.

24. (Currently Amended): A process for making light valves comprising:
forming a seal between two cover sheets at the circumference of the smaller sheet,
~~optionally with fill and vent ports in the seal,~~
and with the seal spacing apart the cover sheets, thus forming a cavity,
wherein:
into said cavity is injected a liquid which then becomes a solid layer,
with the solid layer having a variable transmission of light.

25. (Previously Presented): The process of Claim 24, wherein:
any of the previously claimed materials are used.

26. (Currently Amended): The process of Claim 24, wherein:
said liquid includes [[of]] a monomer solution.

27. (Previously Presented): The process of Claim 24, wherein:
said cover sheets are etched to improve the adhesion between said cover sheet and said
solid layer.

28. (Previously Presented): The process of Claim 24, wherein:
a silane is applied to said cover sheet to improve the adhesion between said cover sheet
and said solid layer.

29. (Previously Presented): The process of Claim 28, wherein:
said silane is a vinyl silane.

30. (Currently Amended): The process of Claim 28, wherein:
said cover sheets are heated to bond said silane to said cover sheets before said injecting.

31. (Previously Presented): The process of Claim 24, wherein:
said cover sheets joined with said seal are cooled before and/or during said injecting and/or

the said liquid becoming said solid, in order to prevent the heat thereby released from reducing said light valve's optical performance or resistance to aging.

32. (Previously Presented): The process of Claim 24, wherein:
said liquid is cooled before said injecting in order to prevent the heat released from said liquid becoming said solid from reducing said light valve's optical performance or resistance to aging.

33. (Previously Presented): The process of Claim 24, wherein:
said cavity is flushed with an inert gas before said liquid is injected into said cavity to prevent incomplete polymerization, or bubble formation in said solid.

34. (Previously Presented): The process of Claim 33, wherein:
the inert gas is nitrogen, argon, or helium.

35. (Previously Presented): The process of Claim 24, wherein:
dissolved gases are removed from said liquid before it is injected into said cavity to prevent incomplete polymerization, or bubble formation in said solid.

36. (Previously Presented): The process of Claim 24, wherein:
the liquid components of said liquid have synchronized metering pumps in order to have a constant ratio between said components, and to fill said cavity with the desired volume of said liquid.

37. (Previously Presented): The process of Claim 24, wherein:
said liquid is injected into said cavity through slot die(s) or hollow needle(s).

38. (Currently Amended): The process of Claim 24, wherein:
~~a tilting top table[[,]] with optional cooling [[,]]~~ is used to help prevent, or to remove bubbles from said liquid in said cavity before it becomes said solid.

39. (Previously Presented): The process of Claim 24, wherein:
said seal is made from a two-sided tape or a ribbon of adhesive.

40. (Previously Presented): The process of Claim 24, wherein:
said seal is made from a sealant that softens upon heating, and becomes a solid again on cooling.

41. (Previously Presented): The process of Claim 40, wherein:
said two cover sheets with said sealant placed between them are placed in a flat or roller press which is heated in order to soften and compress said sealant in order to form the desired spacing between said cover sheets, and to bond said sheets together.

42. (Currently Amended): The process of Claim 24, wherein:
after said liquid has become said solid, an outer seal is formed outside, said outer seal to form a durable mechanical connection between said two cover sheets[[,]] and optionally to

~~cover said fill and vent ports, and optionally to prevent loss of liquid components of said solid layer.~~

43. (Previously Presented): The process of Claim 42, wherein:
said outer seal is made from a sealant that melts upon heating for application as a liquid, and becomes a solid again on cooling.

44. (Previously Presented): The process of Claim 42, wherein:
said outer seal is made with a sealant based on a saturated hydrocarbon liquid or solid polymer, with functionality for crosslinking.

45. (Currently Amended): The process of Claims 19 through 23, ~~and or~~ 42, wherein:
said outer seal is made from the sealants previously claimed.

46. (Previously Presented): The process of Claim 24, wherein:
said light valve is made on production machinery that has been designed for making sealed double pane windows, and that has been modified for making said cavity thinner, and has been added on to enable injecting said liquid into said cavity.

47. (Currently Amended): The processes process of any one of Claims 24 through 44 or claim 46, wherein:
~~they are it is used to make architectural glazings that control unwanted solar heat and or glare.~~

48. (Currently Amended): The process of Claim 24 characterized in that wherein:
some of the apparatus for preparing said liquid for said injecting, and/or for injecting said liquid, is contained within a cooling chamber.

49. (Currently Amended): The process of Claims 24, 31 or 38, characterized in that wherein:
said injecting is ~~done performed~~ on a tilting top table,
and/or a cooled plate[.][.]
~~and optionally enclosed within a cooling chamber.~~

50. (New): The light valve of Claims 1 or 3, wherein:
the catalyst for said crosslinking monomer is a reducer and an oxidizer.

51. (New): A sealant of claim 19, wherein the polymer having the average functionality of two or more is made by reacting said polymer functionality with a crosslinker which has a functionality of two or more, and which is soluble in said polymer.

52. (New): A process for making the light valves of claim 24 wherein the seal includes fill and vent ports.

53. (New): The process of Claim 38, wherein:
the tilting top table is cooled.

54. (New): The process of Claim 42, wherein said outer seal covers said fill and
vent ports, and prevents loss of liquid components of said solid layer.

55. (New): The process of Claim 49 wherein said injecting is performed within a
cooling chamber.